

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY EXAMINATION REPORT



(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>M/44295-PCT</b>	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. <b>PCT/EP 03/12527</b>	International filing date ( <i>day/month/year</i> ) <b>10.11.2003</b>	Priority date ( <i>day/month/year</i> ) <b>11.11.2002</b>
International Patent Classification (IPC) or both national classification and IPC <b>H01M8/02, H01M8/04, H01M8/24</b>		
Applicant <b>NUVERA FUEL CELLS EUROPE S.R.L. et al.</b>		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.  
  
☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of    sheets.

3. This report contains indications relating to the following items:
  - I    ☒ Basis of the opinion
  - II   ☐ Priority
  - III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
  - IV   ☐ Lack of unity of invention
  - V    ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
  - VI   ☐ Certain documents cited
  - VII ☐ Certain defects in the international application
  - VIII ☐ Certain observations on the international application

Date of submission of the demand  <b>11.06.2004</b>	Date of completion of this report  <b>04.04.2005</b>
Name and mailing address of the international preliminary examining authority:   European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer  <b>Wiedemann, E</b>  Telephone No. +49 89 2399-7542  

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/EP 03/12527

**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

**Description, Pages**

1-17 as originally filed

**Claims, Numbers**

1-16 as originally filed

**Drawings, Sheets**

1/8-8/8 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. **PCT/EP 03/12527**

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,

☒ claims Nos. 16

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☒ no international search report has been established for the said claims Nos. 16

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the Standard.

☐ the computer readable form has not been furnished or does not comply with the Standard.

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Yes: Claims	6, 10, 12-14
	No: Claims	1-5, 7-9, 11, 15
Inventive step (IS)	Yes: Claims	
	No: Claims	1-15
Industrial applicability (IA)	Yes: Claims	1-15
	No: Claims	

2. Citations and explanations

**see separate sheet**

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/EP 03/12527

**Re Item V**

**Reasoned statement with regard to novelty, inventive step or industrial applicability;  
citations and explanations supporting such statement**

Reference is made to the following documents:

- D1: EP-A-0 999 605 (HONDA MOTOR CO LTD) 10 May 2000 (2000-05-10)
- D2: US-A-3 926 676 (FRIE WOLFGANG ET AL) 16 December 1975 (1975-12-16)
- D3: US-A-4 233 146 (KATTERMANN DIETRICH E ET AL) 11 November 1980 (1980-11-11)
- D4: GB-A-1 214 359 (ALLMANNA SVENSKA ELEKTRISKA AKTIEBOLAGET) 2 December 1970 (1970-12-02)

The arguments given by the applicant are not considered as convincing with respect to the present formulation of the claims.

Claim 1 refers to an electrochemical generator which is defined by comprising porous current collectors which correspond with feeding devices and extracting devices. The asymmetric pressure drop is firstly not a product feature but defined as a "result to be achieved" and it is linked to the feed and/or extraction device and not to specific parts of the unit.

Therefore, all objections as set forward in the search report remain unchanged, which read:

**2) Novelty**

The subject-matter of claims 1-5, 7-9, 11 and 15 is not considered to be novel, Article 33 (1) and (2) PCT.

Document D1 discloses an electrochemical generator with a fluid distribution device inside the generator. The fluid is uniformly delivered to each of the fuel cell units and is uniformly distributed to the active areas of the cells. As can be seen from the Figures 8, 11 and 12 the pressure drop of the distribution or inlet part is not similar to the exhaust or outlet part. Consequently, the pressure drop of the inlet and outlet is asymmetric.

Further, the document recognizes the influence of the channel diameter, the length of a channel and the coefficient of friction on the behaviour of the pressure.

Therefore, the subject-matter of claims 1-5, 7-9, 11 and 15 is not considered to be novel.

Document D2 discloses a fluid distribution system in a fuel cell comprising main inlet and outlet channels and distribution / collecting channels to uniformly distribute the fluid in the active areas.

The pressure loss in the respective areas is different, it is smaller in the supply part and higher

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

---

International application No. PCT/EP 03/12527

in the discharge part. This leads to an asymmetric pressure loss profile between inlet and outlet part of the distribution system.

**3) Inventive Step**

The subject-matter of claims 1-15 is not considered to be based on an inventive step, Article 33 (3) PCT.

3.1 The technical problem underlying the present application is considered to establish an asymmetric pressure drop profile between inlet and outlet part of a low pressure fuel cell.

3.2 This problem is known in the prior art and solved there in a similar manner, see D1 and D2.

3.3 The subject-matter of claims 6, 10 and 12-14 is not considered to be based on an inventive step, for the following reasons:

a) The subject-matter of claim 6 defines the pressure in the feed device of a low pressure fuel cell. The given pressure range is typical for low or ambient pressure fuel cells in the prior art.

b) The subject-matter of claim 10 does not provide technical features which help to solve the technical problem of the present application.

c) The subject-matter of claim 12 and 13 is not considered to be inventive because D3 teaches to use hydrophobic material in supply or discharge channels to influence the fluid behaviour. Fluorinated polymers are well known in fuel cell technology and are used in different parts of the cell. The man skilled in art would apply a fluorinated polymer to the channels when knowing that hydrophobic material influence the pressure drop of the transported fluid.

d) The subject-matter of claim 14 claims a well known feature in the prior art which is to integrate the distribution channels either in the frame or in the sealing gasket of a cell.

**4) Industrial Applicability**

The subject-matter of the present application is industrially applicable in the field of electrochemical generators.